Hunting and feeding in wild dogs[1]

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(With a graph)

These observations are based on our preliminary study of the Indian Wild Dog (*Cuon alpinus*) in the Mudumalai Sanctuary, Tamil Nadu.

Wild Dogs at Mudumalai usually hunt in the early hours of the morning between 6 and 8 a.m. They generally avoid strenuous activity during the heat of the day, seeking shade under rocks, dense underbrush or lying in along the banks of a river. This behavioural thermoregulation greatly influences the daily activity and movements of these dogs living in the tropical and subtropical regions. In cooler seasons they may be active and hunt at any time of the day. They rarely hunt at night but are most active on moonlight nights. This implies that they rely greatly on the sense of sight for hunting. But, in fact, all senses including those of sound and smell, are used flexibly without any particular specialization on any one modality.

During our two month study we were lucky to see a vain attack by wild dogs on a gaur calf which was protected by the determined mother and other members of the herd. Yet the agility and tenacity of the wild dogs gave us an idea of how they tackle a large prey such as the spotted deer or sambar. Further, four fresh kills were discovered before the vultures and other scavengers had arrived to remove everything. They were in varying degrees of mutilation and by the various signs that the dogs had left it was possible to piece together how the prey is brought down and dismembered.

It is highly probable that one of the dogs seizes the deer by the nose, which, like a twitch on a horse, must greatly inhibit its movements. Other dogs attack the hind end, biting the thighs, buttocks and flanks. One dog may secure a hold on the tail and with the other on the nose, one or two dogs on the ears and the rest of the pack pulling at the prey's flanks and hind quarters, a tug-of-war ensues. The prey is pulled down and if it is a fawn it is literally torn apart. There is no killing bite as in the big cats to dispatch the prey swiftly. The wild dogs, although they

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have powerful jaws, have relatively short canine teeth which could not be used to serve the spinal cord of larger prey. These shorter canine teeth, aided by the outer upper incisors which are curved and have evolved into a pair of secondary canines, enable the wild dog to secure a hold on the prey. The sight of several dogs securely attached to the prey and pulling, twisting and tearing at it, has shocked many a hunter who sees the wild dog as bloody killers. They are indeed messy, having no clean and efficient way of killing their prey.

When the flanks are torn open, the prey may be eviscerated as it struggles or is dragged along the ground by other dogs at the head end. The liver, kidneys and the lungs may be eaten and some sections of the intestines except the stomach and rumen which are torn out and left untouched. Similarly with the wildpig, the stomach was untouched by the dogs. The dogs may eat portions of the animal that are torn off as it struggles. Hence the frequent observation that the wild dog will even eat their prey while it is still alive.

The eyelids and eyes may also be eaten. It has been said that the dogs bite out the eyes of the deer and blind them first. Considering the difficulty a wild dog would have in seizing the eyeball, retracted deep into the orbit by retractor oculi muscles as a defensive reflex, this interpretation is unlikely. Rather the dogs remove the eyes when the prey is dead or immobilized in shock, prior to death.

In the absence of a killing bite, what physical stimulus kills the prey? Young fawns suffering from multiple bite injuries have been rescued from wild dogs and they have recovered; others have 'played dead' (the tonic immobility reaction) and suffering from less extensive injuries, were able to run off, once the dogs were chased away. (Davidar: personal communication). Presumably the prey goes into a state of shock, death ensuing rapidly after evisceration, this latter not being the major physical stimulus that kills the prey. In the absence of evisceration, the onset of shock may be prolonged and wild dogs would have to fight with the prey longer and, possibly, sustain injuries themselves during the attack. What more efficient method then, in the absence of more effective weapons, than to disembowel the prey? An understanding of these facts will hopefully give to the hunter and naturalist a clearer understanding of why the wild dogs seem to be such bloody killers.

Analysis of wild dog faeces shows the presence of fur, skin, hooves, and teeth of fawns and large quantities of digested bone, which has the consistency of fine chalk. It would be highly adaptive for the wild dogs to ingest fur to protect the alimentary tract from possible injury, especially from the extremely sharp bone spicules from small mammals. It was often with much difficulty that we were able to remove the matted fur that formed tight wads and balls around these splinters of bone. Clearly, if carnivores in captivity are fed on small mammals such as

hares, the carcass should not be skinned but left intact so that the ingested fur may be used to form a protective bolus around any fragments of ingested bone.

The composition of successive stools passed by one dog reflected even more of their eating habits. Some stools contained little or no hair, but mainly dark digested meat protein and occasional strips of partially digested muscle and tendon. Other stools contained fur and a lower proportion of digested protein and bones. Bone fragments were never found in those stools that contained no hair. From this we may conclude that the dogs either purposefully ingested quantities of hair when they also crushed and swallowed bones or in the process of digestion the fur aggregates around the bone fragments and are usually voided together and separate from the meat portion of the meal. Fragments of skull, teeth, claws and ocular lenses embedded in fur attested the fact that small mammals were eaten whole.

A high proportion of sambar remains included ingested grass (*Iseilema prostratum*). One faecal sample contained only grass and twigs; this dog was probably sick since the stool was liquid. The only other vegetable matter ingested in a significant amount was the fruit of *Zizyphus*, which was present in one sample. This fruit is commonly eaten by langur, bonnet macaque, porcupine, spotted deer, pigs and bear. Some fragments of grass, seeds, twigs and bamboo leaves were found in many of the faeces and their presence was probably accidental since a wild dog eating its prey on the ground is bound to pick up such material.

There is no satisfactory answer as to why carnivores eat grass. Like fur it may be an anti-irritant. Grass may also be an important source of vitamins and trace elements not available in the all meat diet, since the stomach contents of chital and pig were not eaten. We were not able to ascertain whether or not the wild dog eviscerated small mammals before eating them but this was certainly the case with the deer and the wild pig.

To determine the predation by wild dog on the deer population of our study area we collected the pelvises and lower jaws of deer. Of the sixty-three pelvises collected fifty-six were chital and the remaining seven sambar. Sex ratios were 23 male to 33 female chital and 5 female to 1 male sambar. (One fragment of pelvis could not be sexed).

In order to gain some insight into the degree of maturity of these kills pelvic index was taken by measuring the distance from the top (anterior rim) of the acetabulum or hip joint and the bottom of the obturator foramen. This index was chosen since it was the most intact region—the ilium and ischium usually being chewed and splintered by the dogs (text figure).

From the figure, it appears that pelvises with an index less than 7.5 cm would be ingested entirely by the wild dogs, since no remains were

found in the field (with the exception of a 2-3 month old fawn killed by three dogs near our camp). This conclusion may not be warranted since a pelvis of 7.5 cm index would be well ossified especially at the region of the acetabulum and could not therefore be easily ingested. It is quite possible then, that wild dogs do not kill many sub-adult fawns with a pelvic index of 6.5-7.5 cm. But this conclusion also may not be warranted, since the field samples were taken in the spring and most fawns would not attain this pelvic index until late summer or autumn. The absence of such remains in the spring collection in this study is an open question. We do not know how long moderately calcified bones remain intact. Their half life may be as short as 2-3 months, since many scavengers, notably porcupines and small rodents, will ingest such bones which constitute a rich source of mineral salts essential to their diet.

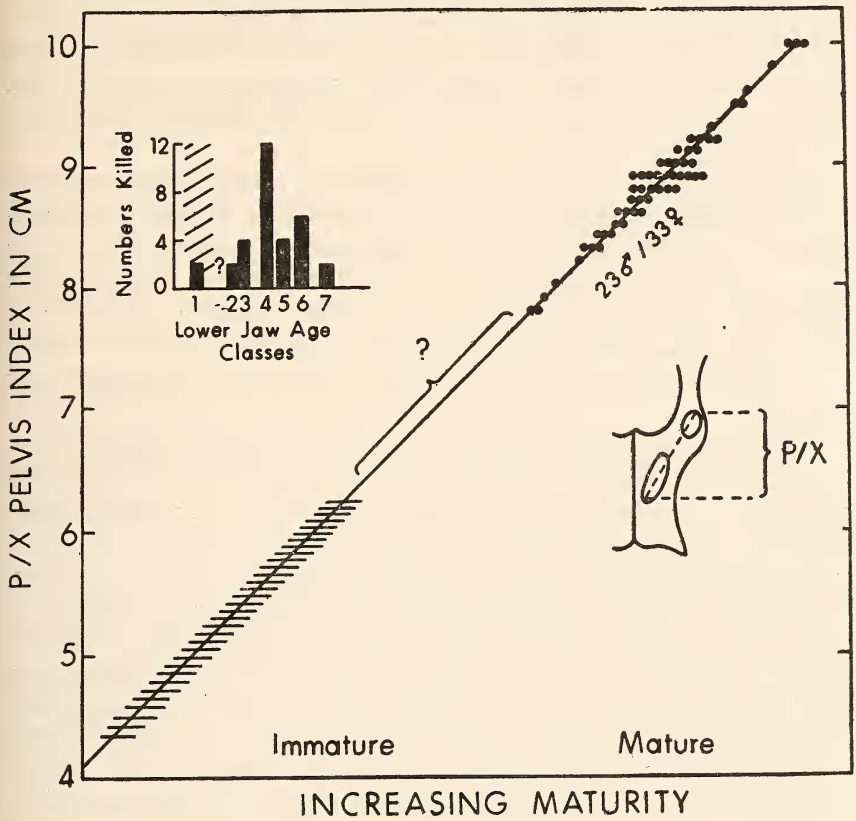
A similar age gap was found in the samples of lower jaws. The same arguments posed above hold for the absence of sub-adult jaws in the collection. Interestingly enough the greatest proportion of kills was in the 4-6 year (prime) age group. This may not be an indication that the wild dogs selectively kill animals of this age, but rather that the majority of animals in the herds fall (with the exception of the large annual fawn crop) within this age group. This conclusion is supported indirectly by the Nilgiri Game Association records of the number of chital shot each year. The numbers have increased greatly over the last few years, indicating that there must be more individuals in the herds which fall into this highly productive age range.

The age classes of kills identified from lower jaws are shown in the figure and this follows Schaller's (1967) age classification based on the wear on various teeth. Class I represents the fawns and in most of these kills the jaws are eaten by the dogs, since we found only two specimens. Classes 2 and 3 are yearlings and young adults and classes 4, 5 and 6 represent prime adults. Class 7 is past prime. Interestingly no really aged specimens were found, indicating that chital in the Nilgiris rarely live over 8 or 10 years of age.

Only eight lower jaws of the Sambar were collected in contrast to 31 lower jaws of the chital and all of these were subadults. Analysis of faeces confirmed the fact that the chital was the most commonly killed prey during the period of study. We were wary about collecting too many faecal samples from the packs because this might have had some effect on their marking behaviour since the faeces were deposited mainly at communal dunging areas.

The ratio of chital to sambar remains found in the faeces was very close to the ratio of chital to sambar pelvises that were collected in the field (approximately 10:1.5 or for every twenty chital killed three sambar). This ratio accords with the lower population of sambar and with the fact that these deer are very large and powerful and difficult for the

wild dogs to bring down. Presumably the wild dogs kill mainly fawns and subadult sambar since no adult lower jaws were found in the study area.



Graph showing age classes of lower jaws and pelvises.

With greater expertise we might have been able to distinguish between the fur of chital fawns, subadults and adults but this was not possible. Judging from the number of faeces containing digested calcium (from the bones of ingested fawns) the ratio of fawns to adults during the period December-February in the samples was in the ratio of 2:1. A complete tail of a fawn, many small tarsal and carpal bones and undigested hooves were commonly found in these faeces.

It has been said that on a long chase the wild dogs run after the prey in relays and this may be a misinterpretation of canid hunting behaviour and has been clarified somewhat by Hugo & Jane van Lawick's observations of cape hunting dogs in their book THE INNOCENT KILLERS. 'As the prey zig-zags in front of the pack it comes closer to some dogs than to others; the closest dog takes up the chase until the prey

again turns wide and another dog closer to it will take over. The open plains of Serengetti where the cape hunting dog lives is very different from the jungle habitat of the wild dog, although a few small clearings have the park-like appearance of this great African plain. Consequently the hunting strategy of the wild dogs would be adapted to the terrain. Running in relays would result when the prey in front of the lead dog turns wide and the dogs in the rear could intercept it by taking a short cut along one of the many narrow game trails that labyrinth through the dense scrub.

Often chital and sambar kills are found near water and this has led to the common deduction that deer at bay will run to water in their attempt to escape. Many kills, however, are made when deer come to water or at traditional crossing points along the river which they use while travelling from one browsing area to another. Another reason for so many kills being made near a river is that the prey takes the swiftest route away from the dogs, which is down hill where, coincidentally, lies the river.

Beyond doubt, our study confirms that the wild dogs are to be left in peace in the Nilgiris as they are the remaining major predators regulating the deer population. Shooting by sportsmen for 'trophy stags' has little value in maintaining the deer population as the fawn, does, young stags and aged stags would rapidly produce a situation of overpopulation, overgrazing and ultimately, enormous deer mortality from starvation and stress disease (aggravated also by competition with indigenous domestic cattle). As the wild dogs kill on a random-chance basis and as they rarely take sub-adult deer, 1-2 years old, which will be highly productive, their predation is ecologically more adaptive than the human pattern of hunting only trophy stags. The question is whether we are going to allow these graceful hunters to do their job undisturbed.

Reference

Schaller, G. B. (1967): The Deer and the Tiger. University Press, Chicago.